PB-227 052

SIDES: STORET INPUT DATA EDITING SYSTEM

David R. Barrow

Environmental Protection Agency
Athens, Georgia

January 1973

DISTRIBUTED BY:

NTIS

National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

PB 227 052

031054

SIDES

STORET INPUT DATA EDITING SYSTEM

Environmental Protection Agency
Surveillance and Analysis Division
Region IV

JANUARY 1973

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151

SIDES DOCUMENTATION

TABLE OF CONTENTS

		Page No.
I.	SYSTEM DESCRIPTION	1
II.	PREPARING TO RUN THE SYSTEM	4
	A. Allocating Disk Space	4
	B. Setting up the Run Decks	5
	1. The JOBLIB cards	5
	2. The Run Deck for Programs PFST04 and PFST01 . .	5.1
	3. The Run Deck for Programs PFST05 and PFST03 . .	6
	4. The Run Deck for Programs PFST02 and PFST03 . .	7
	5. The Run Deck for processing file DFST03 into STORET	7.1
	C. Setting up Card File CFST08	8
	1. Deck Description for File CFST08	8
	2. Card Layouts and Field Content Description for File CFST08	10
	a. The STORET Agency Card	10
	b. The YEAR card	10
	c. The PARAM card	11
	d. The STATN card	11
	e. The PAR card	12
	f. The SIDB card	12
	g. The DTA card	14
	D. Setting up Card File CFST11	15
	1. Deck Description for CFST11	15
	2. Card Layouts for File CFST11	15
	The DDIN card	
III.	How to Process a Batch of Data Through the System . . .	17
IV.	How to Correct Data Already Placed into STORET by the SIDE System	18
	A. To change a Parameter Value for a Sample	18
	B. To Add a Parameter Value for a Sample	18
	C. To Delete a Parameter Value for a Sample	18
	D. To Add, Replace, or Delete %RB for a Sample	19
	E. To Add, Replace, or Delete Depth for a Sample . . .	19
	F. To Add, Replace or Delete Any Sample Identification Field Except Depth and %RB	19
	G. To Delete a Sample Entirely	20

TABLE OF CONTENTS (continued)

		Page No.
V.	To Correct Data Already in STORET that was not Entered Through the SIDE System	21
VI.	Diagnostic Messages and What They Mean	22
	A. Error Messages from Program PFST01	22
	B. Error Messages from Program PFST03	29
	C. Error Messages from Program PFST04	30

SIDES

STORET INPUT DATA EDITING SYSTEM

by

David R. Barrow
Pollution Control Systems and Analysis Branch
Surveillance and Analysis Division
Region IV Environmental Protection Agency
College Station Road
Athens, Georgia 30601

January 1973

ic

STORET Input Data Editing System (SIDES)

Introduction

The Water Quality Control Information System provides a broad data management capability for all activities of EPA's water programs activities. Central to both the program activities and the data management system is the need to store and retrieve ambient water quality data. The initial stages of the data management system were designed to fulfill that basic need. That was the beginning of STORET.

Decentralization of STORET through the use of a time sharing computer and remote terminals has provided Input/Output capability to a vast network of users both within and outside EPA. However, with decentralization, problems of input control and demands for more rapid response increased. Major improvements in STORET have been made over the years, most notably the streamlined retrieval routine "DISTRIBUT" and the expanded analytical and graphic display capability. Input and data quality control have received relatively little attention. To address this need for Input Control and to fulfill the mission of Pollution Control Systems and Analysis Branch to 1) provide data processing support for the Division of Surveillance and Analysis, 2) provide technical assistance to States and other system users, and 3) utilize the STORET system in support of Regional programs, a program was undertaken to develop Input procedures.

The first result of this development effort was DIPEDIT; a procedure designed specifically for low speed terminal applications. The present report provides documentation for SIDES, a procedure designed specifically for field survey data and medium speed terminal, card input applications.

Purpose

The STORET Input Data Editing System (SIDES) is designed to fulfill the following needs:

- An easy-to-use card format for entering data into STORET particularly with respect to sample identification.
- A comprehensive pre-STORET editing system including immediate printouts to facilitate checking numerical data.
- A simplified method for correcting data already entered into STORET through SIDES.

Features

SIDES provides several notable features to facilitate the achievement of its purposes:

- Double entry of station and sample descriptions to permit machine editing.
- Left justified, fixed field key punching.
- Capability to handle composite and grab samples interchangably.
- Data field sequencing as in DIP.
- Comprehensive and easy to read editing diagnostics.
- Field station numbers which may be different from STORET primary or secondary station numbers.
- Data reports generated from intermediate files to permit data editing prior to storage in STORET.

Application

SIDES was developed for application to field study data where several sets of data are collected at the same stations over a relatively short period of time. Specifically it was designed to improve data quality control and reduce turn around time between field study and report preparation. However it should find wide application to any system which handles repetitive sampling and analysis from a fixed station network.

Operating experience over the last six months has indicated that even on small volume jobs, the overhead of double entry of identification information may be more than offset by the rapid turn around and editing capability.

Computer System Specifications

This system has been programmed in PL/IF language on the System of Boeing Computer Services, McLean, Virginia. This system is an IBM 370/155 with OS/MVT/HASP.

SIDES DOCUMENTATION

I. SYSTEM DESCRIPTION

The STORET Input Data Editing System (SIDES) is composed of five programs: PFSTO1, PFSTO2, PFSTO3, PFSTO4, and PFSTO5 (see Figure 1). There are 11 named data files: 2 card files, and 9 disk files. One of these files, DFSTO5, is a STORET file. The parameter titles in the title records (record codes 31, 32 and 33) in file DFSTO4 are obtained from this file. In addition to the 11 named data files, sort programs PFSTO5 and PFSTO2 each have six disk work files.

All data to be processed by the system are entered through file CFSTO8. This file is composed of card images and may be an actual card deck or may be a card image file on disk or magnetic tape. Files created by TSO may also be processed if they contain 80 character unnumbered records. Currently the system can handle up to 60 parameters in one pass. More than 60 parameters can be handled by repeated passes through the system. The number of card images that may be entered through file CFSTO8 is limited to 65535 by the card sequencing scheme employed by program PFSTO4.

Input file CSFTO8 is read by program PFSTO4. Using files DFSTO9 and DFST10 as work files, program PFSTO4 merges sample identification cards (SIDB) and data cards (DTA) by matching each DTA card with the SIDB card having the same sample number as that on the DTA card. Program PFSTO4 then creates files DFSTO2 and DFSTO1 for input to program PFSTO1. Files DFSTO2 and DFSTO1 are composed entirely of the cards read in from CFSTO8. File DFSTO2 consists of editing information cards and file DFSTO1 consists of the cards containing sample identification information for the data to be processed, and data values for the parameters measured. Program PFSTO4 also produces a Run Information Report, RFSTO4A. This report gives the counts of records read and written and lists any cards not properly matched during the merging of files DFSTO9 and DFST10.

Program PFSTO1 is the central program in the system. It reads files DFSTO1, DFSTO2, and DFSTO5; and produces files DFSTO3 and DFSTO4 and report RFSTO1A. The program performs very extensive editing of all cards read from files DFSTO1 and DFSTO2. Each of these cards is written onto report RFSTO1A together with error messages describing any error detected during the editing operation. Report RFSTO1A provides the system user with a simple means of detecting many key punch and transcription errors.

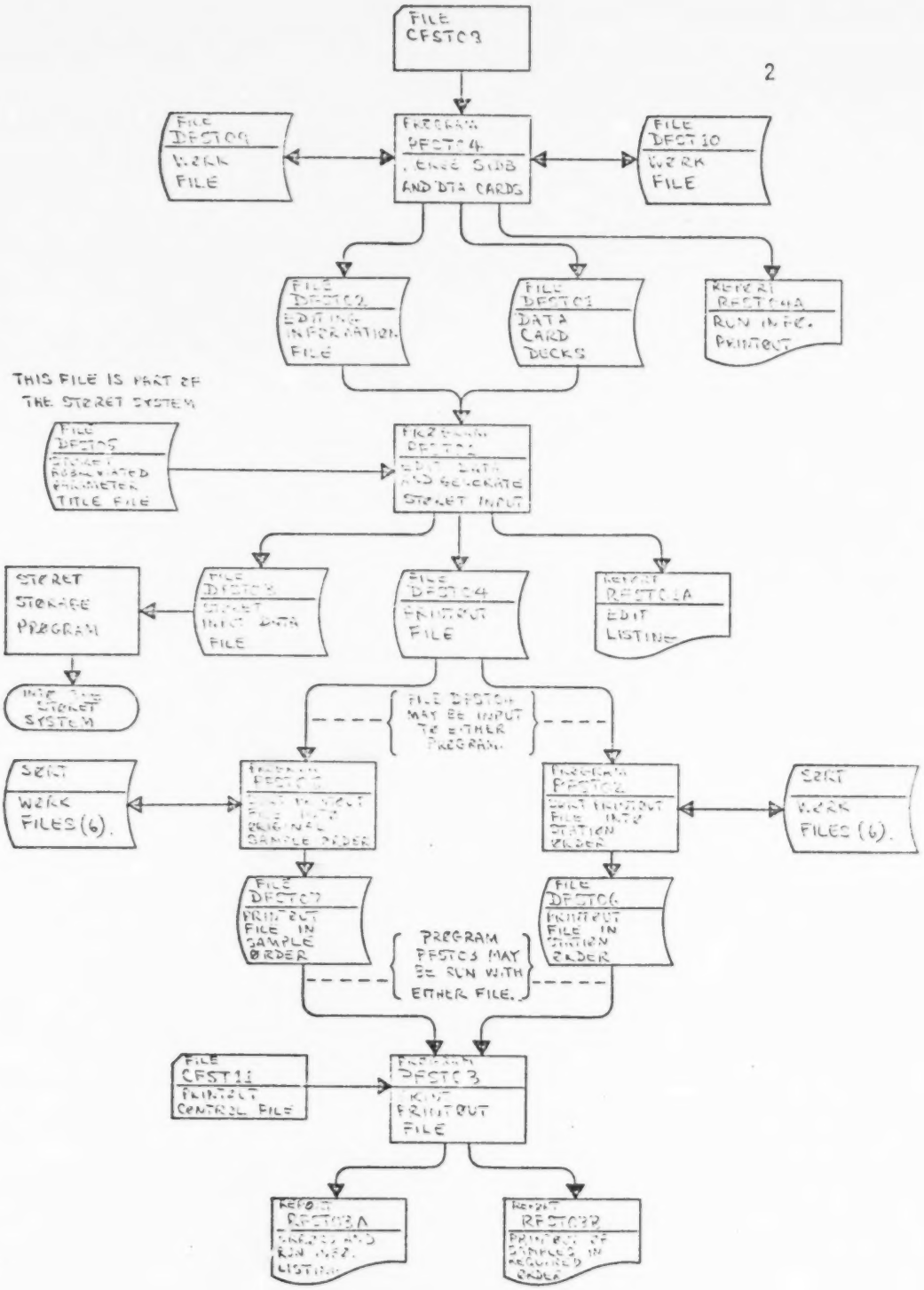
FILE CFSTC3
FILE DFSTC9 WORK FILE
PROGRAM DFSTC4 . EDIT STNB AND DTA CARDS
FILE DFSTC10 WORK FILE
FILE DFSTC2 EDITING INFORMATION FILE
FILE DFSTC1 DATA CARD DECKS
REPORT DFSTC4A RUN INFO. PRINTOUT
THIS FILE IS PART OF THE STRET SYSTEM
FILE DFSTC5 STRET ABBREVIATED PARAMETER TITLE FILE
PROGRAM DFSTC4 EDIT DATA AND GENERATE STRET INPUT
STRET STORAGE PROGRAM
FILE DFSTC8 STRET INPUT DATA FILE
FILE DFSTC4 PRINTOUT FILE
REPORT DFSTC4A EDIT LISTING
INTO THE STRET SYSTEM
FILE DFSTC4 MAY BE INPUT TO EITHER PROGRAM
SORT WORK FILES (6).
PROGRAM DFSTC5 PRINT PRINTOUT FILE IN ORIGINAL SAMPLE ORDER
PROGRAM DFSTC6 PRINT PRINTOUT FILE IN STATION ORDER
SORT WORK FILES (6).
FILE DFSTC7 PRINTOUT FILE IN SAMPLE ORDER
FILE DFSTC6 PRINTOUT FILE IN STATION ORDER
PROGRAM DFSTC5 MAY BE RUN WITH EITHER FILE.
FILE CFST11 PRINTOUT CONTROL FILE
PROGRAM DFSTC3 KWT PRINTOUT FILE
REPORT DFSTC3A SUMMARY AND RUN INFO. LISTING
REPORT DFSTC3B PRINTOUT OF SAMPLES IN REQUIRED ORDER

FIGURE 1. SYSTEM LAYOUT

I. (Cont)

For each sample whose sample identification card (SIDB) and data card (DTA) pass all of the editing tests, a series of card images is written into file DFSTO3. These card images contain the sample identification and the data in the format required for entry into STORET. The data in file DFSTO3 may be entered into STORET at the discretion of the user by processing them through the standard STORET storage program.

Regardless of whether or not the SIDB and DTA cards for a particular sample pass all edit tests, one or more records are written into file DFSTO4. Each data record (record code = 50) in file DFSTO4 contains the sample identification fields from a SIDB card and up to seven parameter values taken from the SIDB card (depth, % from right bank (hereafter called %RB), and sample number) and from the associated DTA card (all other parameters for that sample). Each data record in file DFSTO4 is tagged to indicate whether or not the sample for which it is being produced has passed all edit tests. This tag will permit programs using this file to ignore records containing potentially erroneous data.

File DFSTO4 may be processed by either program PFSTO5 or PFSTO2 or both. These two programs are IBM system sorts. File DFSTO4 is not altered when it is used by either program.

Program PFSTO5 sorts file DFSTO4 into the order required by program PFSTO3 to print the data records in the same order in which the samples were processed through PFSTO1. File DFSTO7 contains the sorted records.

Program PFSTO2 sorts file DFSTO4 into the order required by program PFSTO3 to print the data records in order by station, starting date, starting time, ending date (composite samples), and ending time (composite samples). File DFSTO6 contains the sorted records.

Program PFSTO3 is a print program. In any one run, PFSTO3 reads a control card from file DFST11 that specifies whether file DFSTO6 or DFSTO7 is going to be read during that run. If the control card specifies that file DFSTO6 is going to be read, the program prints the contents of file DFSTO6 in station order. If the control card specifies that file DFSTO7 is to be read, the program prints the contents of DFSTO7 in the original sample order. Since only one of the two sorted files may be read during one run of PFSTO3, it would take two separate runs of PFSTO3 to obtain printouts in both the original order and in station order.

II. PREPARING TO RUN THE SYSTEM.

A. Allocating Disk Space.

There are only two disk files for which space must be allocated prior to running the system. These are files DFST03 and DFST04. All other disk files are temporary in nature and are allocated and deleted during the running of the system.

If the following job is run to allocate disk space for files DFST03 and DFST04, ample space for most needs will be obtained.

```
//JOBNAME JOB JOB,CARD,
//S1     EXEC PGM=IEFBR14
//*  DD1 ALLOCATES SPACE FOR DFST03.
//DD1  DD  DISP=(NEW,KEEP),UNIT=3330,VOL=SER=VOLUME1,
//    SPACE=(TRK,(20,10)),DSN=CNAAAA.III.DSNAME1,
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=8000)
//*  DD2 ALLOCATES SPACE FOR DFST04.
//DD2  DD  DISP=(NEW,KEEP),UNIT=3330,VOL=SER=VOLUME2,
//    SPACE=(TRK,(20,10)),DSN=CNAAAA.III.DSNAME2,
//    DCB=(RECFM=FB,LRECL=142,BLKSIZE=6390)
```

The above job will allocate enough space to permit processing at least:

290 samples with 57-62 parameters/sample,
340 samples with 50-56 parameters/sample,
390 samples with 43-49 parameters/sample,
450 samples with 36-42 parameters/sample,
540 samples with 29-35 parameters/sample,
675 samples with 22-28 parameters/sample,
900 samples with 15-21 parameters/sample,
1350 samples with 8-14 parameters/sample, or
2700 samples with 3- 7 parameters/sample.

II.A.(cont'd.)

In using the above estimates the %RB, depth, and sample number must be included in the number of parameters per sample. For example, if it is desired to store dissolved oxygen, pH, conductivity, temperature, iron, mercury, and DDT, the user must consider that he has 10 parameters/ sample since %RB, depth, and sample number always must be considered as having been specified even if no data has been specified for %RB or depth. The reason that these parameters must be included is that space is reserved for them in file DFST04 even though %RB or depth is not present.

B. Setting Up the Run Decks.

1. The JOBLIB cards. Each run deck must contain the JOBLIB cards immediately following the JOB card. The JOBLIB cards are as follows:

```
//JOBLIB   DD   DISP=SHR,DSN=EPA.PH.GAFFKEN.LOD
//         DD   DISP=SHR,DSN=EPA.PH.GAFFKEN.LOD
```

II.B.(cont)

2. The Run deck for Programs PFST04 and PFST01.

```
//JOBNAME JOB JOB.CARD.
//JOBLIB DD CARDS GO HERE.
//* THIS STEP RUNS THE PROGRAM PFST04 TO SET UP FILES FOR PFST01.
//S1    EXEC PGM=PFST04,REGION=130K
//SYSPRINT DD SYSOUT=A
//PFST04A DD SYSOUT=A
//DFST02  DD  DSN=&T02,UNIT=SYSDA,DISP=(NEW,PASS),
//    SPACE=(TRK,(3,1),RLSE),
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=6400)
//DFST01  DD  DSN=&T01,UNIT=SYSDA,DISP=(NEW,PASS),
//    SPACE=(TRK,(25,5),RLSE),
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=6400)
//DFST09  DD  DSN=&T09,UNIT=SYSDA,DISP=(NEW,PASS),
//    SPACE=(TRK,(25,5),RLSE),
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=6400)

//DFST10  DD  DSN=&T10,UNIT=SYSDA,DISP=(NEW,PASS),
//    SPACE=(TRK,(20,5),RLSE),
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=6400)
//*
//* ***************************************************************
//*  ********** CARDS FOR FILE CFST08 GO HERE. **********
//* IF ACTUAL CARDS ARE TO BE PROCESSED, USE THE FOLLOWING CARD:
//* //CFST08  DD  *
//*
//* IF THE CARD IMAGES ARE ON DISK IN A WYLBUR 'CARD'-TYPE FILE,
//*   USE THE FOLLOWING TWO CARDS:
//* //CFST08  DD  DISP=SHR,DSN=CNAAAA.III.DSNAME3,
//* //    UNIT=3330,VOL=SER=VOLNME3
//*
//*  WHERE DSNAME3 IS THE NAME OF THE DATA SET, AND VOLUME3 IS THE
//*  VOLUME UPON WHICH THE DATA SET RESIDES.
//*
//* IF THE CARDS ARE IN A WYLBUR 'EDIT'-TYPE FILE,
//*  THEN THE FOLLOWING 2 CARDS MUST BE INSERTED AS JOB STEP SO
//*  JUST AFTER THE 'JOBLIB' CARD AT THE BEGINNING OF THIS JOB:
//* //S0   EXEC  EDSIN,NAME='CNAAAA.III.DSNAME3',DISK=VOLUME3,
//* //    LRECL=80,BLKSIZE=6400
//*  AND THE FOLLOWING CARD MUST BE USED FOR FILE CFST08:
//* //CFST08 DD DSN=&INPUT,DISP=(OLD,DELETE)
//*
```

II.B.2. (cont)

```
//* ************************************************************
//*
//* THIS STEP RUNS PROGRAM PFST01 TO EDIT THE SAMPLES AND GENERATE
//*       STORET INPUT AND THE PRINTOUT FILE.
//S2   EXEC   PGM=PFST01,REGION=130K
//DFST03  DD  DSN=CNAAAA.III.DSNAME1,UNIT=3330,VOL=SER=VOLUME1,
//    DISP=OLD
//DFST04  DD  DSN=CNAAAA.III.DSNAME2,UNIT=3330,VOL=SER=VOLUME2,
//    DISP=OLD
//DFST05 DD DSN=CMT.ABFO,DISP=SHR
//SYSPRINT DD SYSOUT=A
//PFST01A  DD  SYSOUT=A
//CFST02  DD  DSN=&T02,DISP=(OLD,DELETE)
//CFST01  DD  DSN=&T01,DISP=(OLD,DELETE)
//* THE FOLLOWING JOB STEP PROVIDES A DUMP OF FILE DFST03. THE
//*       PROGRAM IS NOT A PART OF THE SIDES SYSTEM AND MAY BE
//*       REPLACED OR DELETED BY THE USER.
//S3   EXEC   PGM=PUDP01,REGION=50K
//* THIS IS FILE DFST03 FROM THE PRECEDING STEP.
//FILE01  DD  DSN=CNAAAA.III.DSNAME1,UNIT=3330,VOL=SER=VOLUME1,
//    DISP=OLD
//SYSPRINT  DD  SYSOUT=A
//SYSIN DD *
          ;
```

II.B.(cont.)

3. The Run deck for Programs PFST05 and PFST03.

```
//JOBNAME JOB JOB,CARD.
//JOBLIB DD CARDS GO HERE.
//* THIS STEP IS PROGRAM PFST05, AN IBM SYSTEM SORT.
//S1  EXEC  PGM=SORT,REGION=130K,PARM='CORE=110000'
//SORTLIB DD DSNAME=SYS1.SORTLIB,DISP=SHR
//* SORTIN IS DFST04.
//SORTIN  DD  DSN=CMAAAA.III.DSNAME2,UNIT=3330,VOL=SER=VOLUME2,
//    DISP=OLD
//SORTOUT  DD  DSN=&T07,UNIT=SYSDA,DISP=(NEW,PASS),
//    SPACE=(TRK,(20,10),RLSE),
//    DCB=(RECFM=FB,LRECL=142,BLKSIZE=6390)
//SORTWK01  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK02  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK03  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK04  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK05  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK06  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SYSOUT DD SYSOUT=A
//SYSIN DD *
 SORT FIELDS=(3,2,CH,A,1,2,CH,A,5,2,CH,A,7,4,CH,A),SIZE=E2000
 END
//* THIS STEP RUNS PROGRAM PFST03 TO OBTAIN A LISTING OF SAMPLES IN
//*       ORIGINAL ORDER.
//S2   EXEC   PGM=PFST03,REGION=130K
//PFST03A  DD  SYSOUT=A
//PFST03B  DD  SYSOUT=A
//DFST06 DD DUMMY,DCB=BLKSIZE=142
//DFST07  DD  DSN=&T07,DISP=(OLD,DELETE)
//CFST11 DD *
DDIN     DFST07
```

II.B.(cont.)

4. The Run deck for Programs PFST02 and PFST03.

```
//JOBNAME JOB JOB,CARD.
//JOBLIB DD CARDS GO HERE.
//* THIS STEP IS PROGRAM PFST02, AN IBM SYSTEM SORT.
//S1  EXEC  PGM=SORT,REGION=130K,PARM='CORE=110000'
//SORTLIB DD DSNAME=SYS1.SORTLIB,DISP=SHR
//* SORTIN IS DFST04.
//SORTIN  DD  DSN=CNAAAA.III.DSNAME2,UNIT=3330,VOL=SER=VOLUME2,
//    DISP=OLD
//SORTOUT  DD  DSN=&T06,UNIT=SYSDA,DISP=(NEW,PASS),
//    SPACE=(TRK,(20,10),RLSE),
//    DCB=(RECFM=FB,LRECL=142,BLKSIZE=6390)
//SORTWK01  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK02  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK03  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK04  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK05  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SORTWK06  DD  UNIT=SYSDA,SPACE=(CYL,(01),,CONTIG)
//SYSOUT DD SYSOUT=A
//SYSIN DD *
 SORT FIELDS=(1,6,CH,A,19,19,CH,A),SIZE=E2000
 END
//* THIS STEP RUNS PROGRAM PFST03 TO OBTAIN A LISTING OF SAMPLES IN
//*       STATION ORDER.
//S2   EXEC   PGM=PFST03,REGION=130K
//PFST03A  DD  SYSOUT=A
//PFST03B  DD  SYSOUT=A
//DFST07 DD DUMMY,DCB=BLKSIZE=142
//DFST06  DD  DSN=&T06,DISP=(OLD,DELETE)
//CFST11 DD *
DDIN     DFST06
```

II.B.(cont.)

5. The Run deck for processing file DFST03 into STORET.

```
//JOBNAME JOB JOB,CARD.
//JOBLIB DD CARDS GO HERE.
//S0    EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSUT2 DD DSN=&T01,UNIT=SYSDA,DISP=(NEW,PASS),SPACE=(TRK,(1,1)),
//    DCB=(RECFM=FB,BLKSIZE=6400,LRECL=80)
//SYSIN DD DUMMY,DCB=BLKSIZE=80
//SYSUT1 DD *
?START
?01
//S1    EXEC PGM=PUDP01,REGION=90K
//FILE01 DD DISP=(OLD,PASS),DSN=&T01
//        DD DISP=OLD,DSN=CNAAAA.III.DSNAME1,
//            UNIT=3330,VOL=SER=VOLUME1
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
          :
//S2    EXEC STWOJ          SATURDAY STORAGE ONLY.
//*                         FOR WEDNESDAY STORAGE USE STWOJWED
//*                         IN PLACE OF STWOJ.
//DIST.CARDF DD DISP=(OLD,DELETE),DSN=&T01
//     DD DISP=OLD,DSN=CNAAAA.III.DSNAME1,
//     UNIT=3330,VOL=SER=VOLUME1
```

II.(cont'd.)

C. Setting Up Card File CFST08.

1. Deck description for file CFST08.

File CFST08 is composed of two distinct groups of cards: the Editing Information Cards (info cards for short) and the Data Cards. The info cards come before the data cards. Every card in CFST08 has a name which must appear left justified in columns 1-5. The only exception to this rule is the STORET Agency Card which is part of the info cards. If a card other than an Agency Card ('A' in col. 80) does not have a valid card name, it is printed on RFST04A together with the message 'ILL. CARD IGNORED.' and is effectively ignored by program PFST04.

The STORET Agency Card and all cards in CFST08 that are recognized as having valid names are passed on to program PFST01. All info cards are written into DFST02, and all data cards, except any DTA cards that couldn't be matched to SIDB cards, are written into file DFST01. The unmatched DTA cards are written into report RFST04A together with the message 'NOT MATCHED.'.

The info cards consist of the following cards in the order indicated:

the STORET Agency Card,
the YEAR card,
the PARAM cards, and
the STATN cards.

The STORET Agency Card is exactly that. It is identified by the 'A' in column 80 and is passed through the system into file DFST03 completely without editing or change.

The YEAR card will provide program PFST01 with the first and last years during which samples to be processed by this run were taken. This will provide program PFST01 an edit cross-check.

The PARAM cards provide program PFST01 with a list of valid STORET parameter numbers that are used to edit the PAR card. There may currently be up to 63 PARAM cards.

The STATN cards provide program PFST01 with two things. First, they provide a list of valid field station numbers that are used in the editing of the SIDB card. Secondly, they provide a list of STORET station numbers each of which corresponds

II.(cont'd.)

C. Setting Up Card File CFST08.

1. Deck description for file CFST08.

File CFST08 is composed of two distinct groups of cards: the Editing Information Cards (info cards for short) and the Data Cards. The info cards come before the data cards. Every card in CFST08 has a name which must appear left justified in columns 1-5. The only exception to this rule is the STORET Agency Card which is part of the info cards. If a card other than an Agency Card ('A' in col. 80) does not have a valid card name, it is printed on RFST04A together with the message 'ILL. CARD IGNORED.' and is effectively ignored by program PFST04.

The STORET Agency Card and all cards in CFST08 that are recognized as having valid names are passed on to program PFST01. All info cards are written into DFST02, and all data cards, except any DTA cards that couldn't be matched to SIDB cards, are written into file DFST01. The unmatched DTA cards are written into report RFST04A together with the message 'NOT MATCHED.'.

The info cards consist of the following cards in the order indicated:

the STORET Agency Card,
the YEAR card,
the PARAM cards, and
the STATN cards.

The STORET Agency Card is exactly that. It is identified by the 'A' in column 80 and is passed through the system into file DFST03 completely without editing or change.

The YEAR card will provide program PFST01 with the first and last years during which samples to be processed by this run were taken. This will provide program PFST01 an edit cross-check.

The PARAM cards provide program PFST01 with a list of valid STORET parameter numbers that are used to edit the PAR card. There may currently be up to 63 PARAM cards.

The STATN cards provide program PFST01 with two things. First, they provide a list of valid field station numbers that are used in the editing of the SIDB card. Secondly, they provide a list of STORET station numbers each of which corresponds

II.C.1. (cont'd.)

to the field station number on the same STATN card. The STORET station number is very important in that it is used in the generation of the STORET input cards in file DFST03. At present up to 300 STATN cards may be included.

The data cards are the method by which samples are identified to the system and data for the sample is specified. The data cards consist of the following cards in the order indicated:

the PAR card,
the SIDB cards, and
the DTA cards.

The PAR card followed by SIDB and DTA cards is called a data card deck. Any number of data card decks may be processed at one time. If more than 15 data card decks are processed, the data may be stored into STORET, but neither of the SIDES printout programs (in original order or in station order) may be used. The only restrictions are that each data card deck be headed by a PAR card, and that a SIDB card be specified for each sample in a deck even if a SIDB card for that same sample appeared in an earlier data card deck.

The PAR card tells program PFST01 two things. First, it gives a list of the parameter numbers for which data values may be specified for each sample in the data card deck that follows it. Second, it specifies the order in which the parameter values will be found on the DTA card. The order is the same as that on the PAR card.

The PAR card may be continued on up to 9 cards, and up to 10 parameter numbers may be specified on the original card and each continuation card. This gives the capability to specify up to 100 parameters per run. At present the system will allow only up to 60 parameters to be specified, not including %RB, depth, and sample number which are automatically specified by the system and must not appear on the PAR card. In fact, if the user specifies any of these three parameters on the PAR card, the card will be rejected for having specified redundant parameter numbers. A PAR card and any continuation cards will be referred to collectively as the PAR card.

The SIDB and DTA cards jointly provide the information peculiar to each sample. A DTA card and any continuations will be referred to collectively as the DTA card. Each SIDB card provides sample identification information for a sample and the corresponding DTA card specifies values for the parameters that have been measured for that sample. Each SIDB

II.C.1. (cont'd.)

card is tied to its DTA card by the sample number which appears in columns 66-73 of the SIDB card and in columns 8-15 of the DTA card.

The SIDB card cannot be continued, but the DTA card may have up to 9 continuation cards. The original DTA card and each continuation card have six parameter value fields each. This means that the capability exists to specify up to 60 parameter values for each sample in one run, exclusive again of %RB, depth, and sample number, values for which are specified on the SIDB card.

This does not mean that the system cannot handle samples with more than 60 parameters for which values may be measured. By using the SIDB cards several times, making up the appropriate PAR and PARAM cards for each run, and punching the appropriate DTA cards, any number of parameters may be processed by repeated passes through the system.

Three points need to be clarified as to the order of the SIDB and DTA cards.

- For each sample, the original DTA card and any of its continuation cards must appear together in the deck.
- For each sample, each DTA card must be preceded by its SIDB card.
- Whether each DTA card will immediately follow its SIDB card or whether all SIDB cards will be placed together and all DTA cards will be placed together following them is a matter of personal preference.

It is easier in most cases to put all SIDB cards together followed by all DTA cards. If this alternative is selected, the order of the DTA cards must be the same as the order of the SIDB cards.

2. Card Layouts and Field Content Description for File CFSTOS.

a. The STORET agency card must conform to the requirements of the STORET system.

b. The YEAR card.

II.C.2.b. (cont'd.)

Columns	Contents and Description
1-5	'YEAR' Card Name.
10-11	The last two digits of the earliest year during which samples in this run were taken. NUMERIC
15-16	The last two digits of the latest year during which samples in this run were taken. If this field is left blank it will default to the same value as was in columns 10-11. NUMERIC

c. The PARAM card.

Columns	Contents and Description
1-5	'PARAM' Card Name.
10-14	A 5-digit STORET parameter number. NUMERIC
16-21	First line of abbreviated parameter title. ALPHA
23-28	Second line of title. ALPHA
30-35	Third line of title. ALPHA

NOTE: The three fields containing the abbreviated parameter title are not required. They are used only when the parameter number in cols. 10-14 is not in the STORET abbreviated title file DFST05.

d. The STATN card.

Columns	Contents and Description
1-5	'STATN' Card Name.

II.C.2.d. (Cont'd.)

Columns	Contents and Description
10-17	A 1 to 8 character Field Station Number. ALPHA
20-27	The 1 to 8 digit STORET Station Number that is to correspond to the Field Station number in Cols. 10-17. NUMERIC

e. The PAR card.

Columns	Contents and Description
1-5	'PAR' Card Name. Also goes on all continuation cards.
6	Continuation character. blank = original PAR card; 1,2,···,9 indicates first, second,···, ninth continuation card. At present only continuation cards 1 through 5 may be used.
8-12, 13-17, . . . 53-57	Up to ten 5-digit STORET parameter numbers. The first all-blank parameter number field terminates the list of parameter numbers. Any continuations after that are illegal.

f. The SIDB card.

Columns	Contents and Description
1-5	'SIDB' Card Name. Stands for Sample IDentification card, version B.
10-17	Field Station Number. (Not required if STORET Station Number is punched.) ALPHA

II.C.2.f. (Cont'd.)

Columns	Contents and Description
19-26	STORET Station Number. (Not required if Field Station Number is punched.) ALPHA
28-33	Date of Sample (starting date for composites) (yymmdd). This field may be left blank for grab samples or for composite samples without time of day. NUMERIC
35-38	Time of day sample was taken (starting time for composites) (hhmm). NUMERIC
40	For composite samples only. S=space composite; T=time composite; B=both space and time composite; blank=type not specified.
41	For composite samples only. A=the sample is the average of several samples; H=the sample is the maximum of several samples; L=the sample is the minimum of several samples; blank=type not specified.
42-43	For composite samples only. C=data for this sample taken continuously; G=data for this sample is composed of individual grab samples; blank=type not specified; nn=number of samples comprising this sample.
45-50	For composite samples only. NUMERIC Ending date of sample. (yymmdd).
52-55	For composite samples only. NUMERIC Ending time of sample. This field may be left blank only if columns 28-33 were left blank also. (hhmm).
57-60	Depth. Contains an optional 'B' in first position to indicate a bottom sample, followed by a 1 to 3 digit depth in feet; leave the field blank if the sample is to be stored without depth. If the optional 'B' is omitted, the 1 to 3 digit depth must start in the first position of the field.

II.C.2.f. (Cont'd.)

Columns	Contents and Description
62-64	Percent from Right Bank (%RB). The right bank is the bank of a river to your right if you are facing upstream. %RB is either blank or a 1 to 3 digit number between 0 and 100 inclusive. A blank field indicates that no %RB is to be stored for the sample. NUMERIC
66-73	Sample Number. A 1 to 8 digit number that is unique for each sample processed at one time through the system. The same sample number may be used for different samples but the samples may not be processed through the system at the same time. If the sample number is >=0, a STORET input data item will be generated for parameter 00008. If the sample number is <0, a STORET value deletion will be generated. This facility enables the user not to store sample numbers with his data. NUMERIC
75-77	Contains 'DEL' to indicate that this is a sample deletion card, otherwise it is blank.

g. The DTA card.

Columns	Contents and Description
1-5	'DTA' Card Name. Also goes on all continuation cards.
6	Continuation character. blank=original DTA card; 1,2,···,9 indicates first, second,···, ninth continuation card.
8-15	Sample Number. Must be the same as the sample number on the SIDB card for the same sample. Must go on original DTA card and all continuation cards. NUMERIC
16-24	First parameter value field. May contain a value in any numeric format, fixed or floating acceptable to PL/I conversion routines. The value must lie between zero and $.9999 \times 10^9$ because of STORET input format limitations. A blank field indicates a missing

Columns	Contents and Description
	value for the associated parameter and no STORET input is generated. If a remark character is present ('K' for "less than" or 'L' for "greater than". As strange as it may seem!), it must go into the first location in the field. The value must start in the first column of the field if no remark is present; it must start in the second column if a remark is present. There may be no intervening blanks in the value. Whether or not a remark is present, the program will only pick up 8 columns for the value. If a value already in STORET is to be deleted, the letter D must be in the first position of the field, and the rest of the field must be blank.
26-34	Second parameter value field.
.	
.	
.	
66-74	Sixth (and last) parameter value field.

D. Setting Up Card File CFST11.

1. Deck Description for CFST11.

File CFST11 is ready by program PFST03. At present file CFST11 contains only card; the DDIN card. The DDIN card specifies the ddname of the file to be read by the program. Currently only two ddnames are legal: DFST07 and DFST06. The program will open only the file whose ddname is specified. This allows the program to process files sorted in different ways with a minimum of program code modification.

The ddname on the DDIN card implicitly specifies the output format to be processed. If DFST07 is specified, the program produces a printout of samples in the order they were processed through program PFST01. If DFST06 is specified, the program produces a printout of samples in field station order.

2. Card layouts for file CFST11.

The DDIN card.

II.D.2. (Cont'd.)

Columns	Contents and Description
1-5	'DDIN' Card Name.
10-17	Contains the 1 to 8 character ddname of the ddcard that points to the file to be processed by the program. Currently, only 'DFST06 ' and 'DFST07 ' may be specified. ALPHA

III. How to Process a Batch of Data Through the System.

The following discussion assumes that disk files DFST03 and DFST04 have been successfully allocated and that JCL run decks described in Section II.B. have been successfully set up and tested. It is further assumed that the user is familiar with 360/370-O.S./M.V.T. and with the STORET System. If the run decks have not been tested, include that as part of running the first batch of data through the system. This may be done by tracking down and eliminating JCL problems as they arise. This must in fact continue to be done throughout the life of this system due to the complexities of IBM 360/370-O.S./M.V.T.

A. Set up the editing information cards of file CFST08 described in Section II.C.1.

B. Set up the data card decks of file CFST08 described in Section II.C.1.

C. Place the info cards and data card decks into the run deck for programs PFST04 and PFST01 behind the //CFST08 DD * card; or, if CFST08 is on disk, make up a DD card for CFST08 that points to the data set containing the card images.

D. Execute programs PFST04 and PFST01 over and over until all errors detected by the programs have been corrected.

E. Execute either or both program pairs PFST05 and PFST03 or PFST02 and PFST03 to obtain printouts that may be used in proof-reading the data for keypunch errors or transcription errors. If any such errors are found, correct them and go back to step D.

F. When the user is satisfied that all errors have been detected and corrected, he may then process the data in file DFST03 into STORET using the deck described in Section II.B.5. A word of caution is in order at this point, however. The user must be sure that the last run of programs PFST04 and PFST01 processed the data he wishes to store. Otherwise, he may store data totally different from that he intends to store. This danger arises from the fact that each time programs PFST04 and PFST01 are run, the contents of files DFST03 and DFST04 just prior to the run are completely erased and replaced by the output of the last run.

IV. How to Correct Data Already Placed into STORET by the SIDES System.

Once the data have been placed into STORET it is very difficult to correct them. SIDES offers some relief by permitting the already existing SIDB and DTA cards to be modified only where necessary to make almost any change required for data already entered into STORET.

The procedures outlined below are designed to help the user of the system to overcome most of the difficulties associated with changing data in STORET. Each procedure addresses itself to some particular change to be made on data in STORET. As many of these particular changes as desired may be made on one or more samples, and these changes may be processed through the system and into STORET at one time.

A. To change a parameter value for a sample.

1. Simply change the value on the DTA card for the sample.

2. Process the corrected sample through SIDES and into STORET per Section III.

B. To add a parameter value for a sample.

1. Simply punch the desired value in the position on the DTA card that corresponds to the parameter number on the PAR card for which the value is to be added.

2. Process the corrected sample through SIDES and into STORET per Section III.

C. To delete a parameter value for a sample.

1. Simply replace the parameter value on the DTA card with a 'D' in the first position of the value field and blanks in the rest of the field.

2. Process the corrected sample through SIDES and into STORET per Section III.

IV. (cont'd)

D. To add, replace or delete %RB for a sample.

The same methods apply as with any other parameter except that the %RB field of the SIDB card is the affected field. See A, B, and C above.

E. To add, replace or delete depth for a sample.

1. If the user wishes to add depth to a sample, he must duplicate the SIDB card for the desired sample, punching the desired depth into the depth field as he does so. If he wishes to change depth for a sample, he must duplicate the SIDB card, changing the depth to the desired value. If he wishes to delete depth for a sample, he must duplicate the SIDB card, leaving the depth field blank.

2. Next replace the old SIDB card with the new SIDB card, made in step 1, that has the desired depth field.

3. Then punch 'DEL' into columns 75-77 of the old SIDB card and place this card behind the new SIDB card. The old SIDB card is now called a sample deletion card. Placing the sample deletion card behind the new SIDB card will insure that the DTA card is properly matched to the new SIDB card and not to the sample deletion card by accident. What has actually been done by the above procedure is to create a situation that will entirely delete the old sample including all parameter values and will create a new sample with the desired depth when the cards are processed through the system and into STORET.

4. Process the corrected sample and the sample deletion card through the system and into STORET per Section III.

F. To add, replace, or delete any sample identification field on the SIDB card other than the depth field or the %RB field, simply follow the same procedure as was given for the depth field in E above.

IV. (Cont'd.)

G. To delete a sample entirely.

1. Remove the DTA card for the sample from the data card deck.

2. Punch 'DEL' in columns 75-77 of the SIDB card for the sample and replace it in the data card deck. This changes the SIDB card into a sample deletion card.

3. Process the sample deletion card through the system and into STORET per Section III.

V. To correct data already in STORET that was <u>not</u> entered through the SIDES system.

Correction of such data is not recommended unless such a quantity of data must be corrected that it will justify the overhead of the extra cards that must be punched.

VI. Messages and What They Mean.

In designing the SIDE system, it was decided to use abbreviated but mnemonic error messages that describe as specifically as possible the actual cause of the error condition. For example, if the starting time on a SIDB card contained the string 'U300' instead of '1300', the edit program would print '-->ILL.ST.TM.' (Illegal starting time) printing an error code -- say 34 -- or the message 'CONVERSION ERROR'. The '-->' simply gives a visual accent to the error message.

In the list of error messages below, an attempt has been made to expand each error message, and to give the possible causes of the error message.

A. Error messages from program PFST01.

Program PFST01 prints out each card that it reads from files CFST01 and CFST02. The card image is preceded and followed by a single quote, or apostrophe, to delimit the card. Any error messages that may apply to that card or that may occur while that card is being processed will be printed starting in the columns following the card image on the same or following lines. All such error messages begin with the characters '-->' for emphasis. A warning error message begins with '-->W:'. There are a few error messages that deviate from these rules, and any such deviation will be noted with the message explanation.

1. The following messages are all associated with errors in the editing info cards.

'UNKNOWN CARD.' This message is printed for each card that has an illegal name. The card is ignored while the rest of the info cards are processed, but the program is aborted when it finishes reading the info file (CFST02).

'BAD ST.YR.' Columns 10-11 of the YEAR card either are blank, contain non-numeric characters, or when added to the variable called century -- currently set to 1900 -- produce a year earlier than 1950.

'BAD END.YR.' Columns 15-16 of the YEAR card either contain non-numeric characters or when added to the variable CENTURY -- currently set to 1900 -- produce a year earlier than 1950.

'TOO MANY STATN CARDS.' If the contents of the current STATN card were placed into the station info tables they would overflow.

VI.A.1. (Cont'd.)

'FIELD STA.NR.MISSING.' The field station number field of the STATN card is blank. This field is required to set up a correspondence between field and STORET station numbers. If the user is not employing field station numbers on the SIDB cards to identify his samples, he must still fill in the Field Station Number field on the STATN card with a unique number. This number may be the same as the number in the STORET Station Number field.

'STRT.STA.NR.MISSING.' The STORET station number field of the STATN card is blank. This field is required to set up a correspondence between field and STORET station numbers.

'TOO MANY PARAM CARDS.' If the contents of the current PARAM card were placed into the parameter info tables they would overflow.

'ILL.PARAM.NR.' Either the STORET parameter number field of the PARAM card is blank or contains non-numeric data.

'W:PARAM.NR NOT IN ABB.FILE.' This message is a warning message designed to call the user's attention to a possible key punch error on the PARAM card. This message appears when no record is found for the specified parameter number in the STORET parameter abbreviation file DFST05. If this message appears with a PARAM card, the three title fields on that card will be picked up without editing to provide the titles required by file DFST04.

NOTE: The following three (3) messages are printed, when they appear, at the left hand side of the page immediately following the listing of the info cards.

'AGENCY CD.MISSING.' A valid STORET agency card was not found in the info cards. Check for a missing 'A' in col. 80 if agency card was present or for a misplaced agency card.

'YR.CD.MISSING.' Either the YEAR card had a mispunched name, had errors in its data fields, or was actually missing.

VI.A.1. (Cont'd.)

'ERRS.DETECTED IN INFO CDS.' This message simple reiterates the fact that an error has been found in the info cards. It is printed just before the program is aborted.

2. The following messages are produced for errors associated with a PAR card.

'CONT.SEQ.ERR.' The continuation character on the current continuation card is out of sequence. The next continuation character must be greater in the collating sequence than the last one.

'CONT.CHAR.OUT OF RANGE.' The continuation character is not within the prescribed range. Currently this range is from '1' to '9' inclusive. Note that although continuation cards '6' through '9' may be punched, the system will accept only the first 5 continuation cards because the system will take only 60 parameters at present.

'ILL.CONT.' A continuation card was encountered when no PAR card was being read. This may be due to the reading of a PAR card having been terminated prematurely by the presence of a blank parameter number field.

'ILL.PARAM.NR.' A parameter number was not found in the parameter info table. The PARAM card for a parameter may have been omitted or mispunched; or an error in a parameter number may actually exist or the number was punched in the wrong columns.

'DUP.PARAM.NRS.' A parameter number was repeated.

'ILL.CHAR.' A character other than the digits '0' through '9' was found in a parameter number.

'TOO MANY PARAMS.' More than the maximum number of parameters was specified on one PAR card. Currently the maximum number is 60.

3. The following error messages are associated with the processing of the SIDB card.

VI.A.3. (Cont'd.)

'PAR CARD MISSING OR IN ERR.' This indicates that no PAR card has been encountered or that it failed to pass all edit tests. Without a good PAR card to tell what parameters may have values specified, the samples cannot be properly processed by the program.

'ERR.IN DEPTH FLD.' The depth field contains bad data. Some possible causes:

- the 'B' not in the first column for a bottom sample.
- the depth value contained non-numeric characters.
- the depth value did not start in the first column of the field.

'ERR.IN % FROM R.B.' This indicates that the %RB field contained non-numeric characters other than a 'D' in the first column.

'% FROM R.B.OUT OF RANGE.' This indicates that the value was either less than zero or greater than 100.

'SAMPLE NR.MISSING OR IN ERR.' This indicates that the sample number field is blank or contains non-numeric characters. The sample number must <u>always</u> be specified on the SIDB and DATA cards.

'W:ILL.STORET STA.NR.IGNORED.' This message indicates that the contents of the STORLT station number field do not match any STORET station number read from the STATN cards. This message is a warning because a valid field station number is sufficient to enable the sample to be processed.

'NO STA.NR.SPECIFIED.' This message indicates that the STORET station number is missing or in error and that the field station number is also missing.

'ILL.FIELD STA.NR.' This message indicates that the contents of the field station number field do not match any of the field station numbers read in on the STATN cards.

VI.A.3. (Cont'd.)

'ST.DT.ILL.OR MISSING.' This message indicates that the starting date either contains non-numeric characters or is missing.

'ST.YR.OUT OF RANGE.' This message indicates the year in the starting date is not within the interval specified on the YEAR card.

'ST.MO.OUT OF RANGE.' This message indicates that the month in the starting date is either less than 1 or greater than 12.

'ST.DA.OUT OF RANGE.' This indicates that the day in the starting date is either less than 1 or greater than the number of days in the month given in the starting date. The number of days in February depends upon whether the year in the starting date is a leap year or not.

'ST.TIME ILL.' This indicates that the starting time field contains non-numeric characters.

'ST.TIME OUT OF RANGE.' This indicates for the starting time either that the time is less than 0001 or greater than 2400 or that the minute is greater than 59.

'ILL.STB FIELD.' This indicates that column 40 contains a character other than 'S', 'T', 'B', or blank.

'ILL.AHL FIELD.' This indicates that column 41 contains a character other than 'A', 'H', 'L', or blank.

'ILL.SAMPLE TYPE FIELD.' This indicates that columns 42-43 contain characters other than 'C', 'G', blank, or a valid number of samples.

'END.DT.ILL.' This indicates that the ending date contains characters other than numeric digits.

'END.YR.OUT OF RANGE.' This indicates that the year in the ending date is not in the interval specified by the YEAR card.

'END.MO.OUT OF RANGE.' This indicates that the month in the ending date is either less than 1 or greater than 12.

VI.A.3. (Cont'd.)

'END.DA.OUT OF RANGE.' This indicates that the day in the ending date is either less than 1 or greater than the days in the month in the ending date. The number of days in February depends upon whether year in the ending date is a leap year or not.

'END.TIME ILL.' This indicates either that the ending time is less than 0001 or greater than 2400 or that the minutes are greater than 59.

'END.DT.-TIME < ST.DT.-TIME.' This indicates that the ending date-time for a composite sample is earlier than the starting date-time.

'ILL.DEL.FLD.' This indicates that columns 75-77 contain characters other than blanks or 'DEL'.

'COMP.FLDS.SPEC.FOR GRAB.' This means "composite fields are specified for a grab sample", and indicates that columns 40-43 contain other than blanks for a grab sample. That the sample is a grab is deduced from the fact that the ending date is blank.

'ST.TM.SPEC.FOR COMP.W/O.TIME.' This means that starting time is specified for a composite sample for which the ending time is not specified. A composite sample without time is termed a standard composite sample by STORET; a composite with time is termed a comprehensive composite sample by STORET.

'NO ST.TM.FOR COMP.W/TIME.' This means that no starting time was specified for a composite sample for which ending time was specified.

4. The following error messages are associated with the processing of a DTA card.

'BAD SIDB CARD.' This indicates that a SIDB card with no errors has not been encountered immediately before the DTA card to which the message applies. The DTA card is ignored.

VI.A.4. (Cont'd.)

'UNEXPECTED DTA CARD.' A DTA card has been encountered in a place that the program thinks a DTA card should not be. This could be caused by errors in a previous continuation of the DTA card or on the original DTA card for the sample.

'CONT.SEQ.ERR.' This means "continuation sequence error". It indicates that the current continuation card is out of sequence or that it has the wrong continuation character punched into it.

'CONT.CHAR.OUT.OF RANGE.' This means that the continuation character is not between '1' and '9' inclusive.

'ILL.CONT.CHAR.' This also means that the continuation character is not between '1' and '9' inclusive.

'ILL.SAMPLE NR.' The sample number in columns 8-15 does not match the sample number in columns 66-73 of the SIDB card immediately preceding the DTA card.

NOTE: Each of the next seven error messages may apply to any of the six parameter value fields of the original DTA card or any of its continuations. Each message is preceded by '-- > FLD dd ', where dd is a 1 to 2 digit number between 1 and 6 at present. This enables the user to easily determine which field or fields has the error described by the remainder of the message.

'EXTRA VALUE.' This means that the field should not contain a parameter value. The reason for this is that the list of parameter numbers supplied on the current PAR card has already been exhausted and no more values should be specified in the remaining value fields.

'NOT LEFT JUSTIFIED.' This means that the first character of a non-blank value field is blank. The contents of the value field must be left justified.

'ILL.CHAR.IN DEL.FLD.' This means that an illegal character has been detected in a value deletion field. A value deletion field consists of a 'D' in the first column followed by all blanks in the remainder of the field.

VI.A.4. (Cont'd.)

'ILL.BLANK.' This means that an intervening blank has been detected in the value in a value field.

'ILL.CHAR.BET.FLDS.' This means that a non-blank character has been detected in the column between two parameter value fields. This could indicate a value in the wrong columns which, if undetected, could cause an erroneous value to be accepted with no error indication.

'ILL.VALUE.' This means that the value in a parameter field contains illegal characters.

'VALUE TOO LARGE.' This means that a value in excess of $.9999 \times 10^9$ was detected in a parameter value field. This limitation is imposed by the STORET input format.

B. Error Messages from Program PFST03.

All error messages printed by program PFST03 begin with '-->'. Any error message is printed in the columns immediately following the printout of the card from file CFST11 or the record from DFST06 or DFST07 that was being processed when the error condition was detected. The printed image of the card from CFST11 or the record from DFST07 or DFST06 is preceded and followed by a single quote (or apostrophe) to delimit the image.

1. The following error messages are associated with file CFST11.

'ILL.CARD.' This means that the associated card has a name in columns 1-5 that the program does not recognize.

'DDIN CARD MISSING.' This means that the program did not find a DDIN card in file CFST11 before the end of that file was encountered.

2. The following error message is associated with the processing of the DDIN card.

'ILL.DDNAME.' This means that an illegal ddname was found in columns 10-17. This could be because the ddname was not left justified in the field.

VI.B. (Cont'd.)

3. The following error messages are associated with the processing of the records from file DFST06 or DFST07.

'ILL.RECORD CODE.' This indicates that the program has encountered a record having an illegal record code. The only legal record codes at present are 30, 31, 32, 33, and 50. This message could indicate that the program is reading the wrong file, or that the file was improperly constructed.

'PARAM.GP.NR.OUT OF RANGE.' This message indicates that there were more than 10 groups of 7 parameters each (parameter groups) in the input file. This would be caused by there having been more than 70 parameters specified on a PAR card to program PFST01. Since the system cannot presently handle more than 60 parameters on one PAR card, this message should never be printed.

'PAR CARD NR.OUT OF RANGE.' This means that more than 15 separate data card decks each headed by a PAR card were processed through program PFST01. Currently, 15 is the maximum number of PAR cards that program PFST03 can accomodate.

C. Error Messages from Program PFST04.

There are very few error messages that may be printed by program PFST04. Each error message is printed in the columns immediately following the image of the card that was being processed when the error condition was detected. The printed image of the card is preceded and followed by a single quote (or apostrophe) to delimit its beginning and end.

'ILL.CARD IGNORED.' This means that the associated card from file CFST08 was not recognized to be either an editing info card or a data card for program PFST01. The card is deleted.

'ILL.REC.NR.ddddd' This means that record (card) number ddddd from file DFST09 had an invalid card name for cards on that file. This is a debugging aid printout and should never occur if the program is working properly and the program is being executed properly.

VI.C. (Cont'd.)

'DEBUG-FAIL 1.' This is a debugging aid printout and should never appear.

'NOT MATCHED.' This means that the associated DTA card or continuation was not matched to a SIDB card having the same sample number. Either the SIDB card was omitted, the sample number was mispunched on one of the cards, or the DTA card was out of order.